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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/580,713 | 12/15/2006 | Junya Maruyama | 290911US0PCT | 5485 |
| 22850 | 7590 | 12/24/2008 | | |
| OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | EXAMINER LEE, BENJAMIN P | |
| | | | ART UNIT 3641 | PAPER NUMBER |
| | | | NOTIFICATION DATE 12/24/2008 | DELIVERY MODE ELECTRONIC |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/580,713 | Applicant(s) MARUYAMA ET AL. | |
| | Examiner BENJAMIN P. LEE | Art Unit 3641 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/25/2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 11-13, 16-18 and 24-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 11-13, 16-18 and 24-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/25/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant amended claims 1-8, 11, 16-18, added new claims 24-28 and canceled claims 9-10, 14, 15 and 19-23 in preliminary amendment dated 5/25/2006.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claims 1, 8, 11-13, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amano et al. (European Patent EP 1 227 016) in view of Hubbard et al. (U.S. Patent 3,557,699) and further in view of Takahara et al. (U.S. Patent 7,263,929).

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3. In regards to claim 1, Amano et al (henceforth referred to as Amano) disclose an igniter device comprising:

a resistance heating element (item 9 of Amano figure 1 following);

gas generant to be ignited by heat generation of the resistance heating element (item "P");

electrode pins connected to the resistance heating element (items 7 and 8);

and a plug for holding the electrode pins (item 19);

and sealing a contact interface between the electrode pins and the plug. Note that the plug of Amano is taught to "seal" the space between the contact pins (items 7 and 8) and a case (item 2);

Amano fails to explicitly teach that the material of the plug is an epoxy resin composition. However, Hubbard et al (henceforth referred to Hubbard) teaches using a heat sink for an igniter fabricated from an epoxy resin composition (col. 3, lines 20-29). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to utilize any of various materials for the plug portion of Amano including an epoxy resin as taught by Hubbard since epoxy resins are good thermal insulators;

Amano fails to explicitly teach that the gas generant is gun powder. However, Takahara et al (henceforth referred to as Takahara) teaches using gunpowder as a gas generant in an igniter component (col. 2, lines 60-67). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to utilize gunpowder as the gas generant in Amano as taught by Takahara since gunpowder is inexpensive and reliable.

4. In regards to claims 8 and 13, Amano discloses that the plug comprises, at a portion thereof on the electrode pin side, a small diameter stepped portion (see Amano figure 1 following). Note that the plug of Amano is illustrated to include at least one stepped portion of a smaller diameter (than the max diameter of the plug) located “on the electrode pin side” to the degree specified by Applicant.

5. In regards to claim 11, Amano discloses gas generator comprising:
a cup (item 1 of Amano figure 1) packed with gas generant (item “P”) to generate gas by burning;
an igniter device arranged in an interior of the cup (item “S”);
and a holder for holding the igniter device and the cup (item 3);
the igniter device comprising a resistance heating element (item 9);
gas generant to be ignited by heat generation of the resistance heating element (item “p”);
electrode pins connected to the resistance heating element (items 7 and 8);
and a plug for holding the electrode pins (see Amano figure 1);
and wherein the holder has insertion holes for allowing the electrode pins to extend through them, respectively (see Amano figure 1);

Amano fails to explicitly teach that the material of the plug is an epoxy resin composition. However, Hubbard et al (henceforth referred to Hubbard) teaches using a heat sink for an igniter fabricated from an epoxy resin composition (col. 3, lines 20-29).

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It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to utilize any of various materials for the plug portion of Amano including an epoxy resin as taught by Hubbard since epoxy resins are good thermal insulators;

Amano fails to explicitly teach that the gas generant is gun powder. However, Takahara et al (henceforth referred to as Takahara) teaches using gunpowder as a gas generant in an igniter component (col. 2, lines 60-67). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to utilize gunpowder as the gas generant in Amano as taught by Takahara since gunpowder is inexpensive and reliable.

6. In regards to claim 12, Amano discloses root portions of the electrode pins extending from the plug (see Amano figure 1). Amano fails to explicitly teach that the root portions are sheathed with skirt portions formed to be integral with the plug and the skirt portions are inserted in the insertion holes. However, Hubbard teaches an insulating material constituting a "plug" which surrounds an electrical "pin" and includes a "skirt" portion that sheathes a root portion of the pin (see Hubbard figure 2 following). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to provide an extended sheathing such as the skirt portion of Hubbard on the root portions of the pins of Amano to provide added structural integrity to the pins and to provide additional insulation to any portions of the pin that are not required to make contact with an electrical component.

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7. In regards to claim 27, Amano teaches that a cross-section area of the insertion hole ranges from more than one to ten times a cross-section area of the electrode pin. Note that the “holes” of Amano are illustrated as at least one diameter of the pin and approximately the same diameter (see Amano figures 1 and 3 following).

8. In regards to claim 28, Amano teaches a sealing material, arranged near the stepped portion, for sealing a space between the holder and the plug (see Amano figure 1). Note that the o-ring (item 28) of Amano constitutes a “sealing material” and is “arranged near the stepped portion” and further provides a seal for a space that is between the holder and plug of Amano.

9. Claims 2-5, 7, 16, 17, 18, 24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amano et al. (European Patent EP 1 227 016) and Hubbard et al. (U.S. Patent 3,557,699) and Takahara et al. (U.S. Patent 7,263,929) as applied to claim 1 above, and further in view of Ueda et al. (U.S. Patent Application Publication 2003/0207117).

10. In regards to claims 2 and 16, Amano as modified fails to disclose that the epoxy resin composition comprises an epoxy resin and a curing agent. However, Ueda et al (henceforth referred to as Ueda) teaches an epoxy resin material with a curing agent (par. 41). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to include a curing agent or catalyst as taught by Ueda with the

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epoxy of Amano as modified to speed up the curing process and provide a more uniform product.

11. In regards to claims 3, 4, 17 and 18, Amano fails to disclose that the epoxy resin composition comprises 30-95 weight % of calcium carbonate filler of the total epoxy resin composition. However, Ueda teaches using a calcium carbonate filler material with an epoxy composition with a concentration of 0 to 90% (pars. 24 and 28). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to include a filler with the epoxy resin of Amano at various weight percent including 0-90 as taught by Ueda to modify the structural properties of the epoxy resin material.

12. In regards to claims 5 and 24, Amano fails to explicitly disclose that the epoxy resin composition comprises at least one resin selected from the group consisting of bisphenol type epoxy resin, novolak type epoxy resin, biphenyl type epoxy resin, naphthalene type epoxy resin, alicyclic epoxy resin, amines epoxy resin, and combinations thereof. However, Ueda teaches using a biphenyl type epoxy resin (par. 18). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to utilize any of various types of epoxy resins for the device of Amano such as biphenyl epoxy resin as taught by Ueda since substituting one known epoxy resin for another known epoxy resin such as biphenyl epoxy resin to obtain the predictable result of providing a heat sink, plug or sealing means etc.

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13. In regards to claims 7 and 26, Amano as modified fails to disclose that the epoxy resin composition further comprises a curing accelerator. However, Ueda teaches using a catalyst (curing accelerator) with the epoxy composition (par. 41). It is well known in the art to utilize curing accelerators in epoxy compositions and it would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to utilize a curing accelerator with the epoxy composition of Amano as taught by Ueda to expedite the curing process providing a more uniform final composite material.

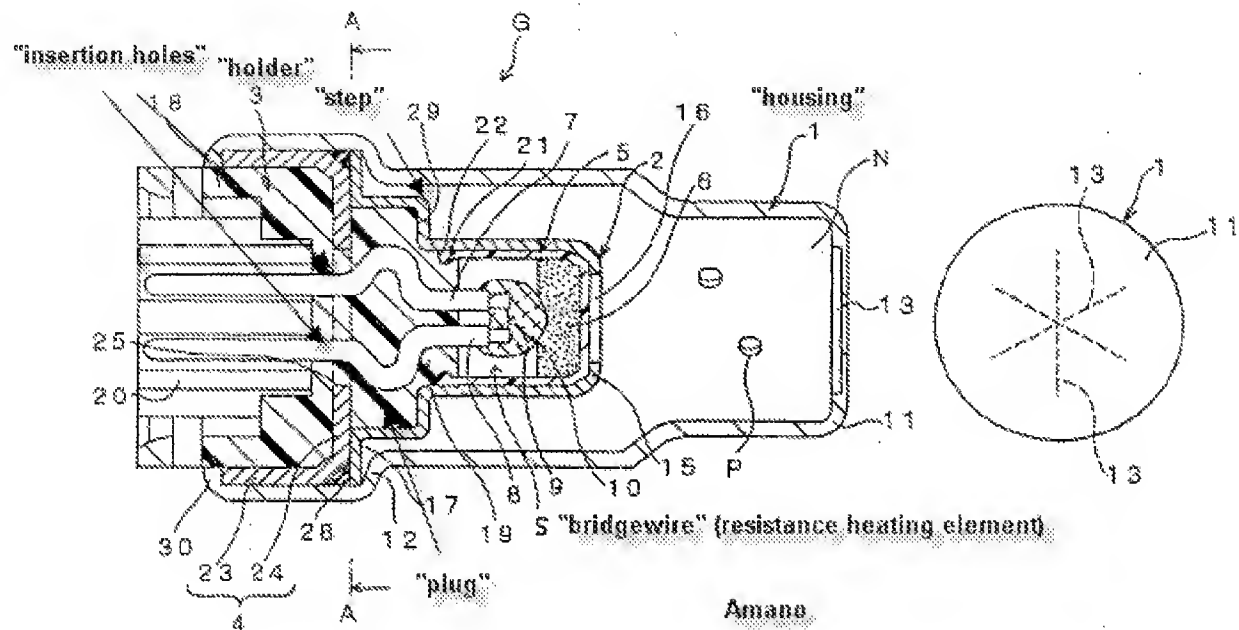
14. Claims 6 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amano et al. (European Patent EP 1 227 016) and Hubbard et al. (U.S. Patent 3,557,699) and Takahara et al. (U.S. Patent 7,263,929) and Ueda et al. (U.S. Patent Application Publication 2003/0207117) as applied to claim 2 above, and further in view of Babel et al. (U.S. Patent 5,413,023).

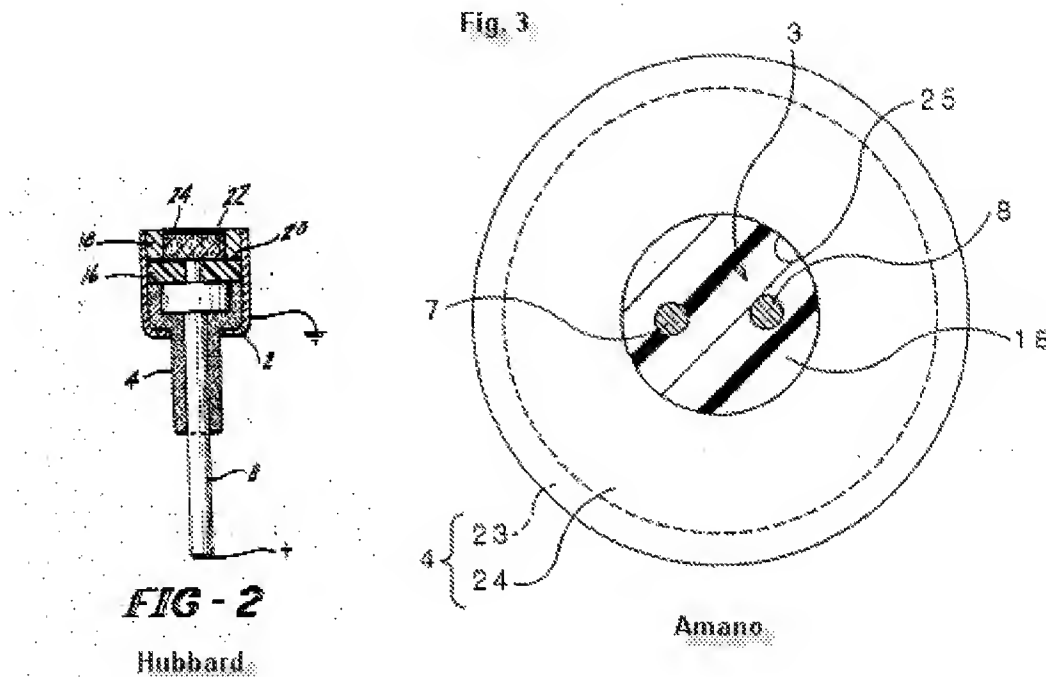
15. In regards to claims 6 and 25, Amano as modified fails to explicitly disclose that the curing agent comprises at least one material selected from the group consisting of phenol novolak resin, acid anhydride, amines, and combinations thereof. However, it is known in the art to provide various types of curing agents with epoxy resins and Babel et al (henceforth referred to as Babel) teaches using an amine type curing agent (benzyl dimethyl amine) (col. 2, lines 24-36) with an epoxy resin composite. It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to utilize any of various curing agents in the device of Amano including BDMA as taught by

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Babel since it is known in the art to substitute one known curing agent for another known curing agent (BDMA) for its inherent advantages.

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Summary/Conclusion

16. Claims 1-8, 11-13, 16-18 and 24-28 are rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin P. Lee whose telephone number is 571-272-8968. The examiner can normally be reached between the hours of 8:30am and 5:00pm on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached on 571-272-6873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published

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applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/B. P. L./
Examiner, Art Unit 3641

/Michael J. Carone/
Supervisory Patent Examiner, Art Unit 3641